Detailed Claim Listing

The following is a detailed listing of all claims that are, or were, pending in the present application. Please maintain withdrawal of claims 16-19, 23-26, 40-45, and 48, cancel claim 28, and amend claims 20, 27, 29-30, and 32-33 as set forth in this detailed listing.

Claims 1-15 (Cancelled)

16. (Withdrawn) A method for increasing the signal-to-noise ratio in the characteristic optical response of an array having subpopulations of sensor elements comprising:

a) providing an array comprising:

i) at least a first subpopulation comprising first sensor elements; and

ii) a second subpopulation comprising second sensor elements;

b) contacting said array with a composition comprising at least a first target analyte;

c) obtaining a first measurement from at least two of said sensor elements of at least one of said subpopulations;

d) summing said first measurements from said sensor elements; and

e) performing a statistical analysis on said first measurements.

17. (Withdrawn) The method according to claim 16 further comprising obtaining at least a first control measurement and adjusting the baseline of said first measurement against said first control measurement.

18. (Withdrawn) The method according to claim 16 wherein the signal-to-noise ratio is increased by a factor of at least 10.

19. (Withdrawn) The method of claim 16 wherein an analyte detection limit is reduced by a factor of at least 100.

20. (Currently Amended) The method of claim 27, wherein said sensor elements are beads and said array comprises ~~a population~~ subpopulations of beads dispersed on a substrate.

21. (Original) The method of claim 20 wherein said substrate is a fiber optic bundle.

22. (Original) The method of claim 20 further comprising identifying the location of each sensor element within each sensor subpopulation within the array.

23. (Withdrawn) The method according to claim 16 wherein said sensor elements comprise chemical functional groups.

24. (Withdrawn) The method according to claim 16 wherein said sensor elements comprise oligonucleotides.

25. (Withdrawn) A method for amplifying the characteristic optical response of an array having subpopulations of sensor elements comprising:

a) providing an array comprising:
   i) at least a first subpopulation comprising first sensor elements; and
   ii) a second subpopulation comprising second sensor elements;
b) contacting said array with a composition comprising at least a first target analyte;
c) obtaining a first measurement from at least two of said sensor elements of at least one of said subpopulations; and
d) summing the optical responses.

26. (Withdrawn) A method according to claim 25 further comprising obtaining at least a first control measurement and adjusting the baseline of said first measurement using said first control measurement.

27. (Currently Amended) A method comprising:

a) providing an array with a plurality of subpopulations of sensor elements, wherein said subpopulations comprise ~~identical~~ sensor elements having the same bioactive agent;

b) contacting said array with a composition comprising at least a first target analyte, thereby producing a response signal at said sensor elements;

c) obtaining individual measurements from each of said ~~identical~~ sensor elements having the same bioactive agent from at least a first of said plurality of subpopulations; and

d) performing a statistical analysis on said measurements from said first of said plurality of subpopulations, whereby statistical validity of said measurements from said ~~identical~~ sensor elements having the same bioactive agent is determined.

28. (Cancelled)

29. (Currently Amended) The method according to claim ~~28~~27, wherein at least one of said bioactive agents is a nucleic acid.

30. (Currently Amended) The method according to claim ~~28~~27, wherein at least one of said bioactive agents is a protein.

31. (Previously Presented) The method according to claim 20, further comprising determining outlying beads and excluding outlying beads from said subpopulation.

32. (Currently Amended) The method according to claim 27, wherein said statistical analysis comprises calculating the mean of at least said measurements from said first of said plurality of subpopulations ~~first and second measurements~~.

33. (Currently Amended) The method according to claim 27, wherein said statistical analysis comprises calculating the standard deviation of at least said measurements from said first of said plurality of subpopulations ~~first and second measurements~~.

34. (Previously Presented) The method according to claim 27, further comprising evaluating the statistical validity of said measurements.

35. (Previously Presented) The method according to claim 27, further comprising performing a second statistical analysis on said measurements.

36. (Original) The method according to claim 35 wherein said second statistical analysis comprises evaluating said measurements using confidence intervals.

37. (Original) The method according claim 35, wherein said second statistical analysis comprises using said measurements to perform hypothesis testing.

38. (Previously Presented) The method according to claim 27, further comprising comparing said statistical analysis of measurements obtained from at least two subpopulations.

39. (Previously Presented) The method according to claim 38, wherein said statistical analysis comprises performing a cluster analysis of measurements from each of said subpopulations.

40. (Withdrawn) A method comprising:

a) providing an array comprising beads on a substrate comprising a plurality of subpopulations of sensor elements; wherein each sensor element comprises a bioactive agent that will bind a target analyte, and at least two of said subpopulations comprise different bioactive agents that will bind the same target analyte;

b) contacting said array with a composition comprising at least a first target analyte;

c) obtaining a measurement from the optical response of each sensor element; and

d) performing a statistical analysis on said measurements from each sensor element.

41. (Withdrawn) The method according to claim 40, wherein at least two of said subpopulations each comprise bioactive agents that will bind different target analytes.

42. (Withdrawn) The method according to claim 41, wherein at least one of said bioactive agents is a nucleic acid.

43. (Withdrawn) The method according to claim 41, wherein at least one of said bioactive agents is a protein.

44. (Withdrawn) The method according to claim 40, further comprising, determining outlying beads and excluding outlying beads from said subpopulation.

45. (Withdrawn) The method according to claim 25, further comprising:

e) performing a statistical analysis on said measurements of at least one of said subpopulations.

46. (Previously Presented) The method according to claim 27, wherein said substrate is selected from the group consisting of glass and plastic.

47. (Previously presented) The method according to claim 20, wherein said substrate is selected from the group consisting of glass and plastic.

48. (Withdrawn) The method according to claim 17 wherein said adjusting comprises subtracting said first control measurement from said first measurement.